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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Atsushi Nakamura

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EXAMINER

AYASH, MARWAN

ART UNIT

PAPER NUMBER

2185

MAIL DATE

DELIVERY MODE

01/12/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/653,962	Applicant(s) NAKAMURA, ATSUSHI	
	Examiner MARWAN AYASH	Art Unit 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action has been issued in response to the amendment filed 10/21/10. Claims 1-2, 5 are pending in this application. Applicant's arguments have been carefully considered, but are not persuasive in view of the prior art as applied to a broadest reasonable interpretation of the claims and/or moot in view of new grounds of rejection. The examiner appreciates Applicant's effort to distinguish over the cited prior art by amending the claims in an attempt to distinguish or clarify the claimed invention, however, upon further consideration and/or search, the claims remain unpatentable over the cited prior art. All claims pending in the instant application remain rejected and clarification and/or elaboration regarding why the claims are not in condition for allowance will hereafter be provided in order to efficiently further prosecution. Accordingly, this action is made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-2, 4-5 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Leong et al. (US Patent # 2003/0182503) in view of Asano et al. (US Patent # 6,820,187) further in view of Berkema (US Patent # 6,185,632).

With respect to **independent claims 1, 2** Leong discloses: An information processing system/method/ including

first and second devices which are connected to each other via an IEEE 1394 connection [client 175, storage system 105, disk array 115 or any combination thereof including elements 145, 150, 155 (Leong – Fig. 1) – all elements may be interconnected via serial bus/intercommunication means; although Leong does not explicitly disclose IEEE 1394, he does disclose a high speed serial interconnection (Leong 0037) which is understood to at least suggest the use of a 1394 connection]; [a 1394 connection is taught by (Berkema title, abstract, Col 1 lines 7-12);

wherein the first device comprises first and second data buffers [storage is comprised of a plurality of buffers, wherein a data buffer is understood to be some unit amount of storage operable to store data therein (Leong Fig. 1, paragraph 0004)] and a transmission unit to the second device, a first operation request block [Leong – paragraph 0046; Berkema Col 1 lines 43-44], [a single (macro-command/request) I/O task is transmitted via transmission means (Leong Fig. 1) from a requestor to one or more targets in the form of a plurality of lower-level asynchronous I/O tasks (micro-commands) (Leong abstract, paragraphs 0014, 0046-0047, 0055)]; [ORB taught by Berkema in Col 1 lines 44-45] which designates a first data communication to be performed with the first data buffer and a second data communication to be performed with the second data buffer [a (macro-command/request) I/O task will designate some communication/processing to be performed for the plurality of data buffers (storage areas) (Leong – abstract, paragraphs 0014, 0046-0047, 0055 and also Fig. 3, 5, paragraphs 0057-0070). Storage system 105 working in conjunction with any of the managers and/or software modules in memory 125 is operable to execute a command/request by interacting with a plurality of storage devices such as those in disk array 115 (Leong – abstract, Fig. 1, paragraph 0020)], the first operation request block including a first identification information for the first data communication to be performed with the first data buffer and a second identification information for the second data communication to be performed with the second data buffer [commands include identification information]; [an exemplary I/O task includes eight parameters, which include identification information respectively indicating the first and second data buffers or storage areas, and commands respectively for the first and second data storage areas (Leong – paragraph 0047 - 0049)],

wherein the second device comprises a completion notifying unit that notifies the first device that the first data communication to be performed with the first data buffer has been completed if the first data communication to be performed with the first data buffer has been completed, and notifies the first device that the second data communication to be performed with the second data buffer has been completed if

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the second data communication to be performed with the second data buffer has been completed [as (micro) I/O tasks, (dealing with individual data buffers or storage areas) complete, the system issues messages/notifications of incremental progress to ensure efficient forward progress of larger tasks (Leong –abstract, paragraph 0050-0052, 0065-0066, 0069)];

wherein the first device further comprises an update unit that updates the first data buffer for which the first data communication has been completed if the completion notifying unit notifies the first device that the first data communication to be performed with the first data buffer has been completed, and that updates the second data buffer for which the second data communication has been completed if the completion notifying unit notifies the first device that the second data communication to be performed with the second data buffer has been completed [*Leong's invention (including first and second devices)* comprises update means to update storage areas for which there are no outstanding (completion notification not yet received) subordinate I/O tasks, and for not updating (via conditional task suspension) storage areas for which outstanding (completion notification not received) I/O task(s) exist or is/are in the process of completing (Leong – Fig. 4, 5) – for example a write command executed by a child I/O task]; [counters/flags are only updated for those data transfer commands that have had notification so completion issued on their behalf (Asano – abstract, Fig. 1, Col 6 lines 12, Col 10 lines 20-30)].

Wherein in the case where the first data buffer is updated by the update unit and the second data buffer is not updated by the update unit, the transmission unit transmits, to the second device, a second operation request block which designates third data communication to be performed with the updated first data buffer and fourth data communication to be performed with the non-updated second data buffer even if the second data communication for the second data buffer has not been completed, the second operation request block including a third identification information for the third data communication to be performed with the updated first data buffer and the second identification information for the fourth data communication to be performed with the non-updated second data buffer [each command designates processing to be performed with data residing in any number of data buffers; note that the first and second data buffers may be accessed by two I/O tasks which do not have corresponding child I/O tasks and thus will not be suspended in order to wait for any child tasks to complete (Leong Fig. 4-5, paragraph 0094), if one task completes, the buffer(s) used may be reused for subsequent operations, if the other task fails to complete, a retry or retransmission operation would have been well within the purview of a skilled artisan at the time of the invention].

wherein the second device further comprises a recognizing unit that (a) recognizes, in accordance with the third identification information, that the third data communication to be performed with the updated first data buffer is performed for transmitting a new data and (b) recognizes, in accordance with the second identification information, that the fourth data communication to be performed with the non-updated second data buffer is performed for retransmitting the data transmitted by the second data communication already designated by the first operation request block [the system recognizes which storage areas/buffers are in-use and which are available for use since storage areas/buffers used by a first I/O task that completes its processing and communication operations may be re-used by subsequent I/O tasks; storage areas/buffers used by a second I/O task that has not completed are not reused until that I/O task completes or otherwise terminates].

Leong does not **explicitly** disclose (hardware) devices comprising completion notifying (hardware) means for notifying each other of the completion of (data access) requests, but rather discloses his invention more so in the context of tasks notifying other tasks of the completion of data access requests. It is understood that the tasks are operating via the underlying hardware devices such that the limitation in question is understood to be at least implicitly taught or strongly suggested by the cited disclosure of Leong. Accordingly, it is noted that one of ordinary skill may understand Leong's disclosure to anticipate the instant claims.

Nevertheless, in the same field of endeavor Asano teaches a multiprocessor system wherein hardware devices (processors, and memory controllers) (Asano Fig. 1, 6-7, 16) operate in a cooperative multiprocessing environment in which commands/requests may be issued executed asynchronously (Asano Col 5 lines 45-51), and without waiting for a response to a previously sent command; wherein hardware means (counters and/or status flags) are provided for notifying other hardware elements of command/request initiated completion of a data communication (Asano – abstract, Fig. 1, Col 6 lines 12, Col 10 lines 20-30).

It would have been obvious to one having ordinary skill in the art at the time of the invention to allow hardware devices to notify each other as opposed to software constructs/mechanisms doing the same because this would be advantageous in terms of implementation flexibility (Leong - 0035) and moreover would have been within the purview of the artisan since it is known in the art that hardware and software are logically equivalent (evidenced by *Tanenbaum* (“*Structured Computer Organization*, 3rd ed. 1990,” section 1.4, page 11, *hardware and software are logically equivalent*)). Therefore it is understood that the tasks, and their underlying hardware perform the functionality of the claimed completion notifying means since although the instant claim limitation is directed toward hardware means for

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notifying a (hardware) device of completion of a data communication, the operations to be performed by the (hardware) means correspond to the operations performed by the tasks and/or underlying hardware supporting the tasks (as disclosed by Leong), and one of ordinary skill in the art would realize that a (software) task performing a set of operations would read upon a hardware element performing those same set of operations.

Leong in view of Asano does not explicitly disclose an IEEE 1394 interconnect, although the disclosure of a high speed serial interconnect, as disclosed by Leong is not far removed from a serial IEEE 1394 connection.

Nevertheless Berkema teaches a high speed communication protocol used for devices connected via an IEEE 1394 connection (Berkema title, abstract).

Therefore Leong in view of Asano further in view of Berkema discloses all limitations of the instant claim(s).

It would have been obvious to one having ordinary skill in the art at the time of the invention to connect components via IEEE 1394 because it is a high speed serial communication bus capable of asynchronous and isynchronous data transmission (Berkema Col 1 lines 7-35)

With respect to **dependent claim 5** as applied to claim 2 above Leong discloses writing data to the first data buffer or reading data from the first data buffer [Leong – paragraph 0020].

Response to Arguments

5. Applicant's arguments filed 10/21/10 have been fully considered but are not persuasive in view of the prior art and/or moot in view of new ground(s) of rejection. All claims pending in the instant application remain rejected. Please note that any rejections/objection not maintained from the previous Office Action have been rectified either by applicant's amendment and/or persuasive argument(s).

Applicant argues that the cited references do not teach the newly worded limitations. The above rejections have been adjusted to correspond to the newly worded limitations.

Conclusion

When responding to the office action, **any new claims and/or limitations should be accompanied by a reference as to where the new claims and/or limitations are supported in the original disclosure.**

THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marwan Ayash whose telephone number is 571-270-1179. The examiner can normally be reached on Mon-Fri 9am-6pm. The examiner may be reached via email for unofficial correspondence at marwan.ayash@uspto.gov.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571)272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12/22/10

Marwan Ayash - Examiner - Art Unit 2185

/Sanjiv Shah/
Supervisory Patent Examiner, Art Unit 2185